Y2K Readiness of Small and Medium-sized Enterprises

Results of a Survey Conducted by
The Mary Kay O'Connor Process Safety Center
College Station, Texas

Mary Kay O'Connor Process Safety Center
Chemical Engineering Department
Texas A&M University System
College Station, Texas 77843-3122

(409) 845-3489

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Y2K Readiness of Small and Medium-sized Enterprises

Executive Summary

A scientific survey of the awareness of Small and Medium-sized Enterprises (SMEs) regarding the Y2K problem indicated: 1) a high degree of awareness, 2) a mixed degree of sophistication and understanding, 3) more than 70% of those surveyed are engaged in Y2K readiness activities, 4) contingency planning is weak, and 5) only 13.5% indicate they have completed their Y2K implementation.

Potential for a catastrophic event is indicated by 4.1% of those responding, while 29.6% indicate economic disruption is the worst possible scenario. While a very few isolated catastrophic events are possible, the most likely scenario could be compared to a localized 3-4 day power outage following a storm, without much associated property destruction. Limited or no downtime while problems are repaired has a much higher likelihood.

Recommendations of critical steps that industry, federal agencies, state and local authorities, and congress can take to prevent Y2K disasters related to SMEs are: 1) continue intensive communication of the need to address Y2K issues and the short time available for remediation; 2) use leverage with suppliers and customers to force remediation of Y2K deficiencies; 3) provide assistance with methodology required to address Y2K problems, 4) publish results on Y2K readiness of specific equipment and procedures to fix them; 5) share testing procedures for Y2K vulnerable equipment; and 6) share contingency planning strategies. Given the shortage of preparation time, special emphasis should be given to contingency planning and communication issues.

Survey results indicate that 39% of the respondents claimed that an external organization verified their testing. The most alarming finding is that only about 13.5% of the surveyed SMEs have completed their Y2K implementation plans.

An overwhelming majority of the respondents (79%) had never been surveyed for a Y2K readiness survey or any other similar surveys. Almost all of the SMEs surveyed either do not belong to any organized professional/trade association, or participate nominally in some regional or nominally active professional/trade association. These two findings point towards a problem much more fundamental and far-reaching than the Y2K issue. Thus SMEs are, in general, far-removed from technology advances, basic information and know-how, and access to technical and financial resources. While the turn of the century could very well pass without any particular problem, this specific finding points to a societal and industry problem which can only be mitigated or solved through industry/government collaborative efforts. Therefore, a major recommendation of this study is to develop a long-term nation-wide program to bring SMEs up to par with respect to chemical safety as well as other related technologies. This consideration has ramifications with respect to a healthy economy and product stewardship.

1.0 Introduction

The Mary Kay O'Connor Process Safety Center initiated this project to conduct a study on "Y2K Readiness of Small and Medium-sized Enterprises (SMEs) involved in chemical, petrochemical, refining, and offshore petroleum activities." The project is supported by a grant from the Nathan-Cummings Foundation.

2.0 Background

The U.S. Chemical Safety Board convened a special expert workshop in Washington D.C. on December 18, 1998, regarding the Year 2000 computer technology problems and their influence on accidental risks in the chemical manufacturing, processing, and handling sector. The report which resulted (available on the world wide web at http://www.chemsafety.gov/y2k) identified a concern that Y2K-related catastrophic events may be associated with SMEs. The major reason for this concern was a lack of good information regarding SMEs' engagement in Y2K readiness projects. This study attempts to address this lack of information.

3.0 Objectives

Included in this study are:

1. a scientific survey of the awareness and engagement of SMEs regarding the Y2K problem,
2. development of a few credible Y2K induced scenarios, including the potential for catastrophic events as well as economic disruptions, and
3. a report based on the research and conclusions derived from the study, including recommendations of critical steps that industry, federal agencies, state and local authorities, and congress can take to prevent Y2K disasters related to SMEs.

4.0 Methodology

A telephone survey was designed, and was edited multiple times with input from survey professionals as well as knowledgeable Y2K experts. The survey as used is provided in Appendix A.

It was initially planned to target approximately 200 small Chemicals and Allied Products Industries firms with less than 50 employees in each of the states of New Jersey, California, Kansas, and Texas. Sites that are part of a large corporation were not included. Utilizing on-line lists of Manufacturers' News, Inc., 100 completed surveys in each state were expected from the initial pool.

The pool in Kansas was too small, so firms with less than 200 employees, which included medium sized firms, were included. The pool in New Jersey was enlarged to include all firms with less than 50 employees listed which were not parts of a large corporation. The

pools in California and Texas were enlarged in an attempt to achieve 100 completed surveys each; however, all companies surveyed had less than 50 employees. Total pool sizes were: New Jersey, 457; California, 443; Kansas, 155; and Texas, 359.

Trained surveyors at the Public Policy Research Institute at Texas A&M University conducted the phone interviews and compiled the statistical results of the interviews. The complete statistical results are shown in Appendix B.

5.0 Results and Findings

Complete telephone interviews by state were: New Jersey, 51; California, 81; Kansas, 67; and Texas, 82. New Jersey SMEs were not very willing to participate, especially after the storm on the East Coast, while Kansas SMEs were much more willing to participate.

Some of the survey results are summarized in Tables 1 and 2. Data in the last column in Table 1 indicates it is likely that many if not all of the SMEs surveyed have some system or the other, which is vulnerable to Y2K failures. Table 2 indicates not all of the SMEs are taking a programmed approach towards Y2K readiness and compliance.

TABLE 1
Percent of Survey Respondents Using Various Systems That Could Potentially be Vulnerable to Y2K Failures

Systems	Does your company use the systems listed in the first column (% Yes Responses)	Are any of the systems listed in the first column susceptible to Y2K failures (% Yes Responses)
Process Computers	51	35
Systems with Embedded Microchips	35	23
Software	95	46
Supply Chain	37	27
Security Systems	50	28

TABLE 2
Percent of Survey Respondents Claiming Various Y2K Readiness and Remedial Measures

Actions Taken	Percent Responding Yes
Inventory/Assessment	74
Correction	79
Testing/Validation	77
Implementation	78
Contingency Planning	60
Communication	72

Other survey results indicate that 39% of the respondents claimed that an external organization verified their testing. Finally, the most alarming finding is that only about 13.5% of the surveyed SMEs have completed their Y2K implementation plans.

An overwhelming majority of the respondents (79%) had never been surveyed for a Y2K readiness survey or any other similar surveys. Almost all of the SMEs surveyed either do not belong to any organized professional/trade association, or participate nominally in some regional or nominally active professional/trade association. These two findings point towards a problem much more fundamental and far-reaching than the Y2K issue. This indicates that majority of the SMEs are disenfranchised and far-removed from technology advances, basic information and know-how, and access to technical and financial resources. While the turn of the century could very well pass without any particular problem, this specific finding points to a societal and industry problem which can only be mitigated or solved through industry/government collaborative efforts. Therefore, a major recommendation of this study is to develop a long-term nation-wide program to bring SMEs up to par with respect to chemical safety as well as other related technologies. This consideration has ramifications with respect to a healthy economy and product stewardship.

A summary of the results follows (see actual questions in Appendix A and complete results in Appendix B):

Q1. Are you aware of the Y2K problem?	Yes	98.9%
Q2A. Does your company use process computers?	Yes	51.4%
Q2B. Does your company use systems with embedded microchips?	Yes	35.3%
Q2C. Does your company use software?	Yes	95.0%
Q2D. Does your company use the supply chain?	Yes	37.1%

(this question may have been misunderstood)

Q2E. Does your company use security systems?	Yes	50.2%
Q3A. Are any of your process computers susceptible to Y2K?	Yes	34.6%
Q3B. Are any of your embedded microchips susceptible to Y2K?	Yes	23.2%
Q3C. Is any of your software susceptible to Y2K?	Yes	46.2%
Q3D. Is any of your supply chain susceptible to Y2K?	Yes	26.7%
Q3E. Are any of your security systems susceptible to Y2K?	Yes	27.8%
Q4A. Actions taken – Inventory / Assessment?	Yes	73.5%
Q4B. Actions taken – Correction?	Yes	78.9%
Q4C. Actions taken – Testing / Validation?	Yes	77.3%
Q4D. Actions taken – Implementation?	Yes	78.4%
Q4E. Actions taken – Contingency Plan?	Yes	59.5%
Q4F. Actions taken – Communications?	Yes	72.0%
Q4G. Actions taken – Other?	Yes	15.8%

New Software	46.9%
Hired Consultant	9.4%
Checking Matter	6.3%
Auxiliary Power	9.4%
Compliance	6.3%
Invalid Response	21.9%

Q5. How many Items are included in your inventory?

Answers ranged from 0 to 100000 as well as Don't Know.

No. Items	Per Cent
<10	25.1%
10 – 60	25.1%
61 – 200	13.1%
250 – 1000	11.2%
1000 – 4000	3.1%
50000 – 100000	1.2%
Don't Know / NA	2.7%

Q6. Did an independent organization verify your testing?	Yes	38.7%

Q7. What is the worst thing that could happen if you had a Y2K failure?

Catastrophic event	4.1%
Economic Disruption	29.6%
No software maintenance functions	33.7%
Other	32.6%

Other Responses –

No problem / nothing	47.0%
Data Loss	6.0%
Invalid Response	4.8%
Inconvenience	32.5%
Reprogram Software	1.2%
Small Interruption	1.2%
Financial Impact	3.6%
Don't Know	3.6%

Q8A. Is your contingency plan linked with emergency responders?	Yes	14.4%

Q8B. Is your contingency plan linked with your facility emerg. team?	Yes	14.1%
Q8C. Is your contingency plan linked with the local fire department?	Yes	20.4%
Q8D. Is your contingency plan linked with local hospitals?	Yes	12.9%
Q8E. Is your contingency plan linked with local police department?	Yes	18.5%
Q8F. Is your contingency plan linked with local sheriff's depart.?	Yes	11.8%
Q8G. Is your contingency plan linked with county civil defense org.?	Yes	7.1%
Q8H. Is your contingency plan linked with depart. of environ. mang.?	Yes	14.6%
Q9. Have you begun a Y2K readiness project?	Yes	21.0%

Q9A. When did you begin your Y2K readiness project?

1 – 3 years ago	40.4%
Summer, 1998	2.3%
Jan. – June	31.2%
July – Dec.	6.9%
1 – 6 mo. Ago	10.6%
Near Future	1.8%
Not Ready	3.2%
> 4 years ago	0.9%
No Project	0.5%
Don't Know	2.3%

Q9B. When did you begin your Y2K readiness project – Month/Day/Year?
(See complete results, Appendix B.)

Q10. Percent Complete for Y2K readiness?

Per Cent Complete	Percent
≤ 75%	8.0%
80 – 99%	30.5%
100%	61.1%

Q11. Have you completed your Y2K implementation?	Yes	13.5%

Q11A. Other Answer Given

Completed / Nearly	48.1%
July – Dec.	24.0%
Jan. – June	5.2%
Before 2000	8.4%
1 – 3 years ago	0.6%
1 – 6 mos. Ago	5.8%
Not Y2K ready	1.9%
Won't	1.3%
After 2000	0.6%
Don't Know	3.2%
Refused / Not Applicable	0.6%

Q11B. Have your completed your Y2K implementation – Month/Day/Year?
(See complete results, Appendix B.)

Q12.

Memberships	Percent
ACPA	2.2%
API	3.7%
CMA	16.4%
CPDA	6.9%

CSMA	5.5%
GPA	1.1%
IIAR	0.7%
ISSA	3.6%
NACD	5.2%
NPGA	3.3%
RISE	3.0%
SOCMA	4.1%
CI	0.8%
OTHER	41.3%

(See complete results, Appendix B.)

Q13. Has your company participated in a previous Y2K survey? Yes 20.6%

6.0 Discussion of Results

Awareness of the Y2K problem was a phenomenal 98.9% among those participating in the survey. Only 51.4% of the participating SMEs use process computers, 35.3% use systems with imbedded chips, 95% use computer software, 37.1% use the supply chain (this question may have been misunderstood since it is pretty difficult to function without use of the supply chain), and 50.2% use security systems. There was some effort in construction of the survey (the survey as used is in Appendix A) to proactively increase awareness among those surveyed.

Self-perceived engagement by SMEs in solving the Y2K problem is shown by the response to Question 4, regarding actions taken to fix any Y2K problems. Actions of those responding were: Inventory/Assessment, 73.5%; Correction, 78.9%; Testing/Validation, 77.3%; Implementation, 78.4%; Contingency Plan, 59.5%; and Communications, 72.0%. As expected, contingency planning is the weakest area. Question 9 (Have you begun a Y2K readiness project?) received only a 21.0% affirmative response; this may be due to the fact that entrepreneurs think in terms of action vs. projects (note also that Correction, at 78.9% received the highest response to Question 4). Question 11 (Have you completed your Y2K implementation) received only 13.5% affirmative response; this is perhaps the area which should receive most concern.

The response to Question 7, regarding the worst thing that could happen if they had a Y2K failure was: Catastrophic Event, 4.1%; Economic Disruption, 29.6%; No Software Maintenance Functions, 33.7%; and Other, 32.6%.

Overall, there appears to be a wide variance in degree of sophistication and understanding of the problem when viewing results of the entire survey; however, it would be reasonable to assume that those utilizing process control computers in their operations are the more sophisticated. Further, it would be reasonable to assume that those recognizing the potential of a catastrophic event or economic disruption would take preventive measures.

6.1 Credible Scenarios

Hardware and/or software that is not Y2K compliant may cause the following: Catastrophic Event; Economic Disruption, Loss of Software Maintenance Functions, Loss of Data, or Inconvenience.

Potential for a catastrophic event is indicated by 4.1% of those responding, while 29.6% indicate economic disruption is the worst possible scenario. While a very few isolated catastrophic events involving loss of life or destruction of property are possible, the most likely scenario of a severe Y2K failure could be compared to a localized 3-4 day power outage following a storm, without much associated property destruction. Limited or no downtime while problems are repaired has a much higher likelihood.

It is expected that SMEs recognizing the potential for a catastrophic event or economic disruption will take action to prevent these events.

7.0 Recommendations

Recommendations of critical steps that industry, federal agencies, state and local authorities, and congress can take to prevent Y2K disasters related to SMEs are:

1. Continue intensive communication of the need to address Y2K issues and the short time available for remediation;
2. Use leverage with suppliers and customers to force remediation of Y2K deficiencies;
3. Provide assistance with methodology required to address Y2K problems,
4. Publish results on Y2K readiness of specific equipment and procedures to fix them;
5. Share testing procedures for Y2K vulnerable equipment; and
6. Share contingency planning strategies.

Given the shortage of preparation time, special emphasis should be given to contingency planning and communication issues.

This study points again to a longstanding deficiency with regard to technical know-how and accessibility to information and technology for SMEs. Thus, a major recommendation of this study is to develop a long-term nation-wide program to bring SMEs up to par with respect to chemical safety as well as other related technologies.

APPENDIX A

Questionnaire For

Survey of SMEs Concerning Y2K Readiness

Questionnaire For

Survey of SMEs Concerning Y2K Readiness

Hello, my name is _____. I am calling from the Mary Kay O'Connor Process Safety Center at Texas A&M University. We are conducting a study on Y2K Readiness of Small and Medium-sized Enterprises, and would like to include your company in our survey. Approximately 400 enterprises, each with less than 200 employees, in four states are being interviewed.

If respondent does not know what Y2K means, then read the following statement. Many systems and pieces of equipment used to sustain process safety in chemical facilities rely on the progression of dates from year to year (for example, 1998 to 1999) to function properly. Many of these systems "read" only the last two digits of the year – 1998 becomes "98," 1999 becomes "99." As a result, they may be vulnerable to problems when the year 2000 (Y2K) begins, because they cannot recognize that "double zero" means 2000, not 1900.

Intro Q1. According to our records Mr./Ms. (insert contact name from call record) is (insert position with company from call record) at this facility. Is this correct?

Yes	1 **(Skip to Intro Q3)**
No	2

Intro Q2. Who now occupies this position? (Record answer on paper record, and ask to speak with that person at this time. If not available, schedule a CB)

Intro Q3. We need to speak directly to Mr./Ms. (insert contact name from call record) or his/her designated person concerned with Y2K issues (or process control or computing). May I speak with one of these individuals?

Yes	1 **(Skip to Repeat introduction below)**
No	2 **(Schedule a CB, record time/date/contact on paper record)**

Repeat introduction to first paragraph then continue. You have been selected to participate in the study. Your responses will be viewed as representative of small and medium-sized enterprises engaged in Chemical, Petrochemical, Refining, and Offshore Petroleum Activities. All replies will be held confidential. You can stop the interview at any time without penalty. If you have any questions regarding this survey, you may call Mr. Charles Isdale at (409) 458-1168 or visit our web site at *http://process-safety.tamu.edu/*.

1. Are you aware of the Y2K problem?

Yes	1	No	2

2. Which of the following types of systems does your company use?

A. Process computers? (Prompts if needed; control, transportation, quality control)

Yes 1 No 2 Don't Know 3

B. Embedded Microchips? (Prompts if needed; Controllers weight / reactor / charging / temperature / pressure / cleaning, stripper, dryer, centrifuge, storage, video cameras, still cameras, alarm systems, clocks, elevators, phones, answering machines, heating / ventilation / air conditioning, fire suppression systems)

Yes 1 No 2 DK 3

C. Software? (Prompts if needed; Mainframe, network, desktop/communication computers, office computers, purchasing, inventory, distribution, sales, accounting, personnel)

Yes 1 No 2 DK 3

D. Supply Chain? (Types listed if needed for prompt; Utilities (electricity, water, waste, communications), Raw suppliers (primary feedstock, initiator-catalyst), Service providers (insurance, hospitals, vending), Customers.)

Yes 1 No 2 DK 3

E. Security? (Types listed if needed for prompt; Video cameras, Security lights, Access (parking, building, room), Alarms (fire, intrusion, warning, process)

Yes 1 No 2 DK 3

3. Are any of the above systems susceptible to Y2K?

A. Process computers?

Yes 1 No 2 N/A 3 DK 4

B. Embedded microchips

Yes 1 No 2 N/A 3 DK 4

C. Software

Yes 1 No 2 N/A 3 DK 4

D. Supply Chain

Yes 1 No 2 N/A 3 DK 4

E. Security

Yes 1 No 2 N/A 3 DK 4

4. Next, I am going to read you a list of actions you may have taken to fix any Y2K problems. Please tell me which actions you may have taken. **(If respondent does not understand the meaning of one of the items, read the definition)**

A. Inventory / Assessment

Yes 1 No 2

(Definition**:** Make a list of all systems, computerized equipment, and devices with embedded computer chips that may be vulnerable to date-change failure. Assess each item listed regarding its relevance to safety; i.e., no consequences, minor accident/reversible injury, irreversible injury/loss of one life, or loss of many lives.)

B. Correction

Yes 1 No 2

(Definition**:** Repair, replace/retire, or work around the vulnerable safety-related systems and equipment that you inventoried.)

C. Testing/Validation

Yes 1 No 2

(Definition**:** Test the ability of the repaired and replacement systems, including interactive systems, to function using Y2K rollover conditions in the real environment or in a realistic simulation.)

D. Implementation

Yes 1 No 2

(Definition**:** Put repaired and replaced systems into permanent use.)

E. Contingency Plan

Yes 1 No 2

(Definition**:** A plan to manage unforeseen problems and emergencies involving each safety-related system and device; i.e., operate manually, or shut down until problems are resolved, additional staffing, etc.)

F. Communications

Yes 1 No 2

(Definition**:** Communicate your readiness and plans to employees, suppliers, vendors, customers, emergency response authorities, local government, and community organizations.)

G. Other _____(Record other response)

Yes 1 No 2

5. How many items are included in your Inventory/Assessment?_____(number)

6. Did an independent organization or firm verify your Testing/Validation?

Yes 1 No 2

7. What is the worst thing that could happen if you had a Y2K failure?

(Read list, choose one)

Catastrophic Event	1
Economic Disruption	2
Unable perform software maintenance functions	3
Other _____ (Record other response)	4

8. Is your contingency plan linked with local emergency responders?

A. Possible emergency responders

Yes 1 No 2

B. Facility emergency team
Yes 1 No 2

C. Local fire department/HAZMAT Team
Yes 1 No 2

D. Local hospitals
Yes 1 No 2

E. Local police department
Yes 1 No 2

F. County sheriff's department
Yes 1 No 2

G. County civil defense organization
Yes 1 No 2

H. Department of environmental management
Yes 1 No 2

9. When did you begin your Y2K readiness project?
(Record as Month/Date/Year) _____

10. In terms of percent, how complete are your preparations for Y2K readiness?
_____%

11. When do you expect your company to complete implementation of it's Y2K plan?
(Record as Month/Date/Year) _____

12. Is your company a member of any of the following trade associations?

A. American Crop Protection Association (ACPA)
Yes 1 No 2

B. American Petroleum Institute (API)
Yes 1 No 2

C. Chemical Manufacturers Association (CMA)
Yes 1 No 2

D. Chemical Producers & Distributors Association (CPDA)
Yes 1 No 2

E. Chemical Specialties Manufacturers Association (CSMA)
Yes 1 No 2

F. Gas Processors Association (GPA)
Yes 1 No 2

G. International Institute of Ammonia Refrigerants (IIAR)
Yes 1 No 2

H. International Sanitary Supply Association (ISSA)

Yes 1 No 2

I. National Association of Chemical Distributors (NACD)

Yes 1 No 2

J. National Propane Gas Association (NPGA)

Yes 1 No 2

K. Responsible Industry for a Sound Environment (RISE)

Yes 1 No 2

L. Synthetic Organic Chemical Manufacturers Association (SOCMA)

Yes 1 No 2

M. The Chlorine Institute (CI)

Yes 1 No 2

N. Other **(Record response)** _____

Yes 1 No 2

13. Has your company participated in a previous Y2K survey?

Yes 1 No 2

DK 8

Thank you very much for your time. That completes our survey.

APPENDIX B

RESULTS OF

Survey of SMEs Concerning Y2K Readiness

SURVEY OF SME'S AND
Y2K READINESS
JULY - SEPTEMBER
1999

STATE IN WHICH
COMPANY IS LOCATED

STATE	Frequency	Percent	Cumulative Frequency	Cumulative Percent
CALIFORNIA	81	28.8	81	28.8
KANSAS	67	23.8	148	52.7
NEW JERSEY	51	18.1	199	70.8
TEXAS	82	29.2	281	100

Q1. ARE YOU AWARE OF THE
Y2K PROBLEM?

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
YES	277	98.9	277	98.9
NO	3	1.1	280	100

Frequency Missing = 1

Q2A. DOES YOUR COMPANY
USE PROCESS COMPUTERS?

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
YES	144	51.4	144	51.4
NO	127	45.4	271	96.8
DON'T KNOW	9	3.2	280	100

Frequency Missing = 1

Q2B. DOES YOUR COMPANY
USE SYSTEMS WITH
EMBEDDED MICROCHIPS?

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
YES	98	35.3	98	35.3
NO	164	59	262	94.2
DON'T KNOW	16	5.8	278	100

Frequency Missing = 3

Q2C. DOES YOUR COMPANY USE SOFTWARE?

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
YES	266	95	266	95
NO	12	4.3	278	99.3
DON'T KNOW	2	0.7	280	100

Frequency Missing = 1

Q2D. DOES YOUR COMPANY USE SUPPLY CHAIN?

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
YES	104	37.1	104	37.1
NO	160	57.1	264	94.3
DON'T KNOW	16	5.7	280	100

Frequency Missing = 1

Q2E. DOES YOUR COMPANY USE SECURITY SYSTEMS?

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
YES	141	50.2	141	50.2
NO	138	49.1	279	99.3
DON'T KNOW	2	0.7	281	100

Q3A. ARE ANY OF YOUR COMPANY'S PROCESS COMPUTERS SUSCEPTIBLE TO Y2K?

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
YES	84	34.6	84	34.6
NO	111	45.7	195	80.2
NOT APPLICABLE/DON'T KNOW	48	19.8	243	100

Frequency Missing = 38

Q3B. ARE ANY OF YOUR COMPANY'S EMBEDDED MICROCHIPS SUSCEPTIBLE TO Y2K?

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
YES	55	23.2	55	23.2
NO	115	48.5	170	71.7
NOT APPLICABLE/DON'T KNOW	67	28.3	237	100

Frequency Missing = 44

Q3C. IS ANY OF YOUR COMPANY'S SOFTWARE SUSCEPTIBLE TO Y2K?

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
YES	128	46.2	128	46.2
NO	133	48	261	94.2
NOT APPLICABLE/DON'T KNOW	16	5.8	277	100

Frequency Missing = 4

Q3D. IS ANY OF YOUR COMPANY'S SUPPLY CHAIN SUSCEPTIBLE TO Y2K?

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
YES	64	26.7	64	26.7
NO	115	47.9	179	74.6
NOT APPLICABLE/DON'T KNOW	61	25.4	240	100

Frequency Missing = 41

Q3E. ARE ANY OF YOUR SECURITY SYSTEMS SUSCEPTIBLE TO Y2K?

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
YES	70	27.8	70	27.8
NO	124	49.2	194	77
NOT APPLICABLE/DON'T KNOW	58	23	252	100

Frequency Missing = 29

Q4A. ACTIONS TAKEN – INVENTORY / ASSESSMENT?

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
YES	205	73.5	205	73.5
NO	69	24.7	274	98.2
DON'T KNOW	5	1.8	279	100

Frequency Missing = 2

Q4B. ACTIONS TAKEN - CORRECTION?

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
YES	221	78.9	221	78.9
NO	56	20	277	98.9
DON'T KNOW	3	1.1	280	100

Frequency Missing = 1

Q4C. ACTIONS TAKEN - TESTING / VALIDATION?

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
YES	214	77.3	214	77.3
NO	57	20.6	271	97.8
DON'T KNOW	6	2.2	277	100

Frequency Missing = 4

Q4D. ACTIONS TAKEN - IMPLEMENTION?

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
YES	218	78.4	218	78.4
NO	54	19.4	272	97.8
DON'T KNOW	6	2.2	278	100

Frequency Missing = 3

Q4E. ACTIONS TAKEN - CONTINGENCY PLAN?

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
YES	166	59.5	166	59.5
NO	107	38.4	273	97.8
DON'T KNOW	6	2.2	279	100

Frequency Missing = 2

Q4F. ACTIONS TAKEN - COMMUNICATIONS?

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
YES	201	72	201	72
NO	72	25.8	273	97.8
DON'T KNOW	6	2.2	279	100

Frequency Missing = 2

Q4G. ACTIONS TAKEN - OTHER?

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
YES	33	15.8	33	15.8
NO	176	84.2	209	100

Frequency Missing = 72

Q4G-OTHER RESPONSE GIVEN

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
NEW SOFTWARE	15	46.9	15	46.9
HIRED CONSULTANT	3	9.4	18	56.3
CHECKING MATTER	2	6.3	20	62.5
AUXILARY POWER	3	9.4	23	71.9
COMPLIANCE	2	6.3	25	78.1
INVALID RESPONSE	7	21.9	32	100

Frequency Missing = 249

Q5. HOW MANY ITEMS ARE INCLUDED IN YOUR INVENTORY?

NUMBER OF ITEMS	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	8	3.1	8	3.1
1	8	3.1	16	6.2
2	9	3.5	25	9.7
3	5	1.9	30	11.6
4	6	2.3	36	13.9
5	10	3.9	46	17.8
6	5	1.9	51	19.7
7	8	3.1	59	22.8
8	5	1.9	64	24.7
9	1	0.4	65	25.1
10	6	2.3	71	27.4
12	8	3.1	79	30.5
14	1	0.4	80	30.9
15	6	2.3	86	33.2
17	1	0.4	87	33.6
18	2	0.8	89	34.4
20	6	2.3	95	36.7
23	2	0.8	97	37.5
24	4	1.5	101	39
25	7	2.7	108	41.7
29	1	0.4	109	42.1
30	4	1.5	113	43.6
36	1	0.4	114	44
40	6	2.3	120	46.3
50	7	2.7	127	49
60	3	1.2	130	50.2
66	1	0.4	131	50.6
75	2	0.8	133	51.4
80	1	0.4	134	51.7
100	13	5	147	56.8
143	1	0.4	148	57.1
150	3	1.2	151	58.3
200	13	5	164	63.3
250	3	1.2	167	64.5
300	3	1.2	170	65.6
400	2	0.8	172	66.4
450	1	0.4	173	66.8
500	3	1.2	176	68
600	3	1.2	179	69.1
730	1	0.4	180	69.5
850	1	0.4	181	69.9
900	2	0.8	183	70.7

1000	10	3.9	193	74.5

Q5. HOW MANY ITEMS ARE INCLUDED IN YOUR INVENTORY? (Cont.)

NUMBER OF ITEMS	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1500	1	0.4	194	74.9
1501	1	0.4	195	75.3
2000	2	0.8	197	76.1
2100	1	0.4	198	76.4
2500	2	0.8	200	77.2
4000	1	0.4	201	77.6
50000	1	0.4	202	78
65000	1	0.4	203	78.4
100000	1	0.4	204	78.8
DON'T KNOW	48	18.5	252	97.3
REFUSED/NOT APPLICABLE	7	2.7	259	100

Frequency Missing = 22

Q6. DID AN INDEPENDENT ORGANIZATION VERIFY YOUR TESTING?

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
YES	106	38.7	106	38.7
NO	157	57.3	263	96
DON'T KNOW	11	4	274	100

Frequency Missing = 7

Q7. WHAT IS THE WORST THING THAT COULD HAPPEN IF YOU HAD A Y2K FAILURE?

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
CATASTROPHIC EVENT	11	4.1	11	4.1
ECONOMIC DISRUPTION	80	29.6	91	33.7
NO SOFTWARE MAINT. FUNCTS.	91	33.7	182	67.4
OTHER	88	32.6	270	100

Frequency Missing = 11

Q7-OTHER RESPONSE GIVEN

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
NO PROB/NOTHING	39	47	39	47
DATA LOSS	5	6	44	53
INVALID RESPONSE	4	4.8	48	57.8
INCONVENIENCE	27	32.5	75	90.4
REPROGRAM SOFTWARE	1	1.2	76	91.6
SMALL INTERRUPTION	1	1.2	77	92.8
FINANCIAL IMPACT	3	3.6	80	96.4
DON'T KNOW	3	3.6	83	100
Frequency Missing = 198				

Q8A. IS YOUR CONTINGENCY PLAN LINKED WITH EMERGENCY RESPONDERS?

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
YES	37	14.4	37	14.4
NO	204	79.4	241	93.8
DON'T KNOW	16	6.2	257	100
Frequency Missing = 24				

Q8B. IS YOUR CONTINGENCY PLAN LINKED WITH FACILITY EMERGENCY TEAM?

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
YES	36	14.1	36	14.1
NO	202	79.2	238	93.3
DON'T KNOW	17	6.7	255	100
Frequency Missing = 26				

Q8C. IS YOUR CONTINGENCY PLAN LINKED WITH THE LOCAL FIRE DEPARTMENT?

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
YES	52	20.4	52	20.4
NO	187	73.3	239	93.7
DON'T KNOW	16	6.3	255	100

Frequency Missing = 26

Q8D. IS YOUR CONTINGENCY PLAN LINKED WITH LOCAL HOSPITALS?

	Frequency Percent Frequency Percent		Cumulative	Cumulative
YES	33	12.9	33	12.9
NO	206	80.8	239	93.7
DON'T KNOW	16	6.3	255	100

Frequency Missing = 26

Q8E. IS YOUR CONTINGENCY PLAN LINKED WITH THE LOCAL POLICE DEPARTMENT?

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
YES	47	18.5	47	18.5
NO	192	75.6	239	94.1
DON'T KNOW	15	5.9	254	100

Frequency Missing = 27

Q8F. IS YOUR CONTINGENCY PLAN LINKED WITH THE COUNTY SHERIFF'S DEPARTMENT?

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
YES	30	11.8	30	11.8
NO	206	81.1	236	92.9
DON'T KNOW	18	7.1	254	100

Frequency Missing = 27

Q8G. IS YOUR CONTINGENCY PLAN LINKED WITH THE COUNTY CIVIL DEFENSE ORGANIZATION?

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
YES	18	7.1	18	7.1
NO	217	85.8	235	92.9
DON'T KNOW	18	7.1	253	100

Frequency Missing = 28

Q8H. IS YOUR CONTINGENCY PLAN LINKED WITH THE DEPARTMENT OF ENVIRONMENTAL MANAGEMENT?

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
YES	37	14.6	37	14.6
NO	198	78.3	235	92.9
DON'T KNOW	18	7.1	253	100

Frequency Missing = 28

Q9. HAVE YOU BEGUN A Y2K READINESS PROJECT?

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
YES	59	21	59	21
NO	222	79	281	100

Q9A. WHEN DID YOU BEGIN YOUR Y2K READINESS PROJECT?

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1 TO 3 YRS AGO	88	40.4	88	40.4
SUMMER 1998	5	2.3	93	42.7
JAN-JUNE	68	31.2	161	73.9
JULY-DEC	15	6.9	176	80.7
1 TO 6 MO. AGO	23	10.6	199	91.3
NEAR FUTURE	4	1.8	203	93.1
NOT READY	7	3.2	210	96.3
MORE 4 YRS AGO	2	0.9	212	97.2
NO PROJECT	1	0.5	213	97.7
DON'T KNOW	5	2.3	218	100

Frequency Missing = 63

Q9B. WHEN DID YOU BEGIN YOUR Y2K READINESS PROJECT - MONTH/DAY/YEAR?

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1/1/97	1	1.7	1	1.7
1/1/98	4	6.8	5	8.5
1/1/99	8	13.6	13	22
1/8/98	1	1.7	14	23.7
1/15/99	1	1.7	15	25.4
2/1/99	11	18.6	26	44.1
2/2/98	1	1.7	27	45.8
2/8/99	1	1.7	28	47.5
2/10/99	1	1.7	29	49.2
3/1/99	4	6.8	33	55.9
3/15/99	1	1.7	34	57.6
4/1/98	1	1.7	35	59.3
5/1/98	1	1.7	36	61
6/1/97	1	1.7	37	62.7
6/1/98	1	1.7	38	64.4
6/1/99	3	5.1	41	69.5
8/1/97	1	1.7	42	71.2
8/1/98	4	6.8	46	78
8/1/99	2	3.4	48	81.4
8/5/99	1	1.7	49	83.1
8/13/99	1	1.7	50	84.7
8/30/99	1	1.7	51	86.4

9/1/95	1	1.7	52	88.1
9/1/98	1	1.7	53	89.8
9/9/98	1	1.7	54	91.5
9/16/98	1	1.7	55	93.2
9/21/99	1	1.7	56	94.9
9/30/98	1	1.7	57	96.6
10/1/98	1	1.7	58	98.3
99/99/99?/DON'T KNOW	1	1.7	59	100

Q10. PERCENT COMPLETE FOR Y2K READINESS?

PER CENT COMPLETE	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	2	0.7	2	0.7
1	1	0.4	3	1.1
5	1	0.4	4	1.5
8	1	0.4	5	1.8
10	1	0.4	6	2.2
20	1	0.4	7	2.5
40	1	0.4	8	2.9
50	4	1.5	12	4.4
60	4	1.5	16	5.8
65	2	0.7	18	6.5
70	1	0.4	19	6.9
75	3	1.1	22	8
80	12	4.4	34	12.4
85	5	1.8	39	14.2
90	25	9.1	64	23.3
95	17	6.2	81	29.5
98	6	2.2	87	31.6
99	19	6.9	106	38.5
100	168	61.1	274	99.6
998?/DON'T KNOW	1	0.4	275	100

Frequency Missing = 6

Q11. HAVE YOU COMPLETED YOUR Y2K IMPLEMENTATION? - YES / NO

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
YES	38	13.5	38	13.5
NO	243	86.5	281	100

Q11A. HAVE YOU COMPLETED YOUR Y2K IMPLEMENTATION? - OTHER ANSWER GIVEN

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
COMPLETED/NEARLY	74	48.1	74	48.1
JULY-DEC	37	24	111	72.1
JAN-JUNE	8	5.2	119	77.3
BEFORE 2000	13	8.4	132	85.7
1 TO 3 YRS AGO	1	0.6	133	86.4
1-6 MOS. AGO	9	5.8	142	92.2
NOT Y2K READY	3	1.9	145	94.2
WON'T	2	1.3	147	95.5
AFTER 2000	1	0.6	148	96.1
DON'T KNOW	5	3.2	153	99.4
REFUSED/NOT APPLICABLE	1	0.6	154	100

Frequency Missing = 127

Q11B. HAVE YOU COMPLETED YOUR Y2K IMPLEMENTATION? - MONTH/DAY/YEAR

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1/1/00	1	2.7	1	2.7
3/10/99	1	2.7	2	5.4
4/30/99	1	2.7	3	8.1

7/1/99	1	2.7	4	10.8
8/30/99	1	2.7	5	13.5
9/1/99	3	8.1	8	21.6
9/15/99	1	2.7	9	24.3
9/21/99	1	2.7	10	27
9/31/99	1	2.7	11	29.7
10/1/98	1	2.7	12	32.4
10/1/99	10	27	22	59.5
10/15/99	1	2.7	23	62.2
10/30/99	3	8.1	26	70.3
10/31/99	1	2.7	27	73
11/1/99	6	16.2	33	89.2
12/1/99	3	8.1	36	97.3
12/24/99	1	2.7	37	100

Frequency Missing = 244

Q12A. MEMBER OF ACPA?

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
YES	6	2.2	6	2.2
NO	246	89.8	252	92
DON'T KNOW	22	8	274	100

Frequency Missing = 7

Q12B. MEMBER OF API?

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
YES	10	3.7	10	3.7
NO	240	88.2	250	91.9
DON'T KNOW	22	8.1	272	100

Frequency Missing = 9

Q12C. MEMBER OF CMA?

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
YES	45	16.4	45	16.4
NO	199	72.6	244	89.1
DON'T KNOW	30	10.9	274	100

Frequency Missing = 7

Q12D. MEMBER OF CPDA?

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
YES	19	6.9	19	6.9
NO	230	83.9	249	90.9
DON'T KNOW	25	9.1	274	100

Frequency Missing = 7

Q12E. MEMBER OF CSMA?

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
YES	15	5.5	15	5.5
NO	226	82.5	241	88
DON'T KNOW	33	12	274	100

Frequency Missing = 7

Q12F. MEMBER OF GPA?

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
YES	3	1.1	3	1.1
NO	247	90.1	250	91.2
DON'T KNOW	24	8.8	274	100

Frequency Missing = 7

Q12G. MEMBER OF IIAR?

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
YES	2	0.7	2	0.7
NO	248	90.8	250	91.6
DON'T KNOW	23	8.4	273	100

Frequency Missing = 8

Q12H. MEMBER OF ISSA?

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
YES	10	3.6	10	3.6
NO	241	88	251	91.6
DON'T KNOW	23	8.4	274	100

Frequency Missing = 7

Q12I. MEMBER OF NACD?

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
YES	14	5.2	14	5.2
NO	227	84.4	241	89.6
DON'T KNOW	28	10.4	269	100

Frequency Missing = 12

Q12J. MEMBER OF NPGA?

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
YES	9	3.3	9	3.3
NO	238	88.5	247	91.8
DON'T KNOW	22	8.2	269	100

Frequency Missing = 12

Q12K. MEMBER OF RISE?

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
YES	8	3	8	3
NO	231	85.9	239	88.8
DON'T KNOW	30	11.2	269	100

Frequency Missing = 12

Q12L. MEMBER OF SOCMA?

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
YES	11	4.1	11	4.1
NO	230	86.1	241	90.3
DON'T KNOW	26	9.7	267	100

Frequency Missing = 14

Q12M. MEMBER OF CI?

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
YES	2	0.8	2	0.8
NO	239	89.8	241	90.6
DON'T KNOW	25	9.4	266	100

Frequency Missing = 15

Q12N. MEMBER OF OTHER?

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
YES	97	41.3	97	41.3
NO	138	58.7	235	100

Frequency Missing = 46

Q12N - OTHER RESPONSE GIVEN

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
CHEM IND COUNCIL	1	1	1	1
ACS	2	2.1	3	3.1
NY/NJ PAINT SOC	1	1	4	4.1
NATL PNT SOC	3	3.1	7	7.2

Q12N - OTHER RESPONSE GIVEN (Cont.)

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
COLOR PRINT MANUF	1	1	8	8.2
NATL ASSC MANUF	1	1	9	9.3
NATL WOODFLOORING	1	1	10	10.3
NNFA	2	2.1	12	12.4
SM BUS ASSOC	2	2.1	14	14.4
IRFA	1	1	15	15.5
SSIA	2	2.1	17	17.5
ASMMA	1	1	18	18.6
AM MICROBIOLOGY ASSC	3	3.1	21	21.6
TX. ASSOC NURSERY	3	3.1	24	24.7
EDA	1	1	25	25.8
ASSOC WATER TREAT	1	1	26	26.8
AFS	1	1	27	27.8
SPI	1	1	28	28.9
NAM	1	1	29	29.9
CHEM ENG ASSOC	2	2.1	31	32
API BLACK ASSOC	1	1	32	33
PIAC	1	1	33	34
CLEANING EQUIP ASSOC	1	1	34	35.1
INTL MAINTAINCE INST	1	1	35	36.1
NRTH TX OIL & GAS	1	1	36	37.1
BETTER BUS BUREAU	1	1	37	38.1
KS MOTOR CARRIERS	1	1	38	39.2

KS PETRO ASSOC	1	1	39	40.2
KS GRAIN & FEED	1	1	40	41.2
PROPANE MARKETERS	2	2.1	42	43.3
AG. READERS ASSOC	1	1	43	44.3
BIO	1	1	44	45.4
AM WELDING SOC	1	1	45	46.4
AWT	1	1	46	47.4
NTL FERTILIZER ASSOC	2	2.1	48	49.5
FARMLND IND	2	2.1	50	51.5
FALT INST	1	1	51	52.6
INV RESPONSE	2	2.1	53	54.6
PROT LINK	1	1	54	55.7
COMPRESSED GAS ASSC	1	1	55	56.7
KGFDA	1	1	56	57.7
KS CHEM & FERT	1	1	57	58.8
AM HARDWARE ASSC	1	1	58	59.8
NPCA	1	1	59	60.8
ADHESIVE MANUF	1	1	60	61.9
NAT FOOD INDST	1	1	61	62.9
AAPG	1	1	62	63.9
NACDS	1	1	63	64.9

Q12N - OTHER RESPONSE GIVEN (Cont.)

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
STEEL STRUCTURE	1	1	64	66
AMS	1	1	65	67
WATER QUALITY ASSOC	1	1	66	68
HIMA	1	1	67	69.1
CTFA	2	2.1	69	71.1
AAIA	1	1	70	72.2
NORTH BOY WORLD TRD	1	1	71	73.2
AESF	1	1	72	74.2
SGIA	1	1	73	75.3
CRMMA	1	1	74	76.3
NATL ASSOC OF FRAG	1	1	75	77.3
NJ BUS AND IND ASSC	2	2.1	77	79.4
NTL FIRE PREV ORG	1	1	78	80.4
CA CHAMBER COMM	1	1	79	81.4
CDIA	1	1	80	82.5
SAE	1	1	81	83.5
COSMETICS	1	1	82	84.5
NPDA	1	1	83	85.6
NAPIM	1	1	84	86.6
APPA	1	1	85	87.6
CANDLE ARTISAN ASSC	2	2.1	87	89.7
PAINT/THINNER ASSC	1	1	88	90.7
TX ASSOC STORAGE	1	1	89	91.8

IADC	1	1	90	92.8
MEDICAL ASSOC	1	1	91	93.8
CMA	1	1	92	94.8
NLA	1	1	93	95.9
NFA	1	1	94	96.9
NY SOC OF CHM ENG	1	1	95	97.9
ISA	1	1	96	99
GRT CHM OF COMM	1	1	97	100

Frequency Missing = 184

Q13. HAS YOUR COMPANY PARTICIPATED IN A PREVIOUS Y2K SURVEY?

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
YES	58	20.6	58	20.6
NO	214	76.2	272	96.8
DON'T KNOW	9	3.2	281	100